

WHAT IS CLAIMED IS:

1. A bi-directional ESD protection device, comprising
5 at least two DIAC devices, each DIAC device comprising
a first and a second p-well separated by an n-well, the p-wells
and n-well being formed in a p-substrate and separated from the
substrate by an n-isolation layer, wherein each p-well has a p-buried
layer formed under it and each p-well includes a p+ region and an n+
10 region.
2. The device of claim 1, wherein the n+ regions in the two p-wells face each
other to define a p+, n+, n+, p+ configuration.
3. The device of claim 1, further comprising at least one additional p+ region
in at least one p-well located between the two DIAC devices.
- 15 4. The device of claim 3, wherein said additional p+ region comprises a p+
ring formed in a p-well surrounding each of the DIAC devices.
5. The device of claim 3, wherein said p+ region is connected to ground.
6. The device of claim 1, wherein for each DIAC, the p+ and n+ regions in the
first and second p-wells are connected together.
- 20 7. The device of claim 6, wherein the p+ and n+ regions in the first and
second p-wells are connected together by means of a first metal layer.
8. The device of claim 6, wherein the n+ and p+ regions in the first p-well of
the one DIAC are connected to an input pad.
9. The device of claim 7, wherein the n+ and p+ regions in the first p-well of
25 the one DIAC are connected to an input pad.
10. The device of claim 9, wherein the n+ and p+ regions in the first p-well of
the one DIAC are connected to the input pad by means of a second metal
layer.
11. The device of claim 8, wherein the n+ and p+ regions in the second p-well
30 of the other DIAC are connected to a ground pad.

12. The device of claim 11, wherein the n+ and p+ regions in the second p-well of the other DIAC are connected to the ground pad by means of a second metal layer.
13. The device of claim 10, wherein the n+ and p+ regions in the second p-well of the other DIAC are connected to a ground pad.
14. The device of claim 13, wherein the n+ and p+ regions in the second p-well of the other DIAC are connected to the ground pad by means of the second metal layer.
15. The device of claim 11, wherein the n+ and p+ regions of the second p-well of the first DIAC are connected to the n+ and p+ regions in the first p-well of the other DIAC.
16. The device of claim 14, wherein the n+ and p+ regions of the second p-well of the first DIAC are connected to the n+ and p+ regions in the first p-well of the other DIAC by means of the second metal layer.